REMARKS/ARGUMENTS

Claims 1-20 are pending in the application. Claims 1, 2, 5-7, 9-11, 14-16, and 18 are amended, no claims are cancelled, and no claims are added. The amendments to the claims as indicated herein do not add any new matter to this application. Furthermore, amendments made to the claims as indicated herein have been made to exclusively improve readability and clarity of the claims and not for the purpose of overcoming alleged prior art.

ALLOWABILITY OF CLAIMS

The indicated allowability of Claims 5 and 14 is gratefully acknowledged. These claims have not been rewritten in independent form at this time however, because it is believed that all of the pending claims are patentable over the references cited and relied upon for at least the reasons set forth hereinafter.

CLAIMS REJECTION—35 U.S.C. § 112, SECOND PARAGRAPH

Claims 1-8, 10-17, 19 and 20 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being incomplete for omitting essential steps, such omission amounting to a gap between the steps. Specifically, the Office Action asserted that a gap exists between the elements of Claim 1 omitting the steps "determining a required recovery time, wherein the required recovery time indicates a maximum length of time that is to be allowed for recovering after said database system failure." This rejection is respectfully traversed.

With respect to this rejection, the Office Action referred to MPEP section 2172.01, which states:

> Unclaimed Essential Matter: A claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record

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may be rejected under 35 U.S.C. 112, first paragraph, as not enabling. In re Mayhew, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). See also MPEP Section 2164.08(c). Such essential matter may include missing elements, steps or necessary structural cooperative relationships of elements **described by the applicant(s) as necessary to practice the invention**. In addition, a claim which fails to interrelate essential elements of the invention as defined by applicant(s) in the specification may be rejected under 35 U.S.C. 112, second paragraph, for failure to point out and distinctly claim the invention. See In re Venezia, 530 F.2d 956, 189 USPQ 149 (CCPA 1976); In re Collier, 397 F.2d 1003, 158 USPQ 266 (CCPA 1968). (emphasis added)

This section sets forth grounds for two distinct types of rejections: (1) a 112 first paragraph (enablement) rejection for claims that omit essential matter, and (2) a 112 second paragraph rejection for claims that fail to interrelate essential elements.

The Gentry Gallery Inc. v. The Berkline Cor. 45 USPQ2d 1498 (Fed. Cir. 1998) (hereinafter "*Gentry*"), sets forth grounds for a third type of rejection that is related to those cited in MPEP 2172.01. Specifically, *Gentry* held invalid under 112 first paragraph (written description) certain claims that did not recite the **location** of a claimed element, because the applicant had urged at numerous places outside the claims that the location of the element was essential to the invention.

None of these sources provide grounds for the rejection given in the present Office Action (i.e. a 112 second paragraph rejection for omitting essential steps). However, because the Office Action makes reference to "omitted essential steps", it shall be assumed for the purpose of this response that the rejection of Claim 1 was meant to be based on 112 first paragraph (enablement).

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THE OMITTED ESSENTIAL ELEMENT CASES

It is the right and responsibility of the Applicant, not the Patent Office, to specify what the Applicant believes to be the metes and bounds of the invention. In general, the claims are the mechanism by which the Applicant communicates the metes and bounds of the invention to the Patent Office (and ultimately to the public).

> ...when the first paragraph speaks of "the invention", it can only be referring to that invention which the applicant wishes to have protected by the patent grant, i.e, the *claimed* invention. For this reason the claims must be analyzed first in order to determine exactly what subject matter they encompass. **The subject matter there set out must be presumed, in the absence of evidence to the contrary, to be that "which the applicant regards as his invention."** *In re Moore and Janoski*, 169 USPQ 236, 238, (CCPA 1971) (emphasis added)

However, in certain cases, some patent applicants have participated in the unwise practice of rigidly and emphatically stating, at locations other than in the claims, the metes and bounds of their invention. When such statements have been made outside the claims, the applicants have not been allowed claims that contradict the statements.

The "omitted essential element" ground of rejection, therefore, hinges on the existence of **statements made by the applicant that prove that what is recited in the claims is not the invention**. In *In re Mayhew* (527 F.2d 1229), this evidence involved statements made in the Specification that the functions of certain claimed elements **were only made possible** by the existence of another element that was omitted from the claims.[1] In *Gentry*, this evidence involved statements in the Specification that **the only possible location** for a claimed element

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[1] "Although appellant now strenuously argues that the cooling bath is optional, his specification not only fails to support this contention, but leads us, as it did the examiner and board, to believe that both it and its location are essential." MAYHEW at 358.

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was at a particular location, where the claims failed to recite that the claimed element was at that

particular location.[2]

Thus, the "omitted essential element" ground of rejection is similar to estoppel in that it

prevents an applicant from making assertions that contradict previously-made statements. In

particular, it prevents an applicant from asserting, implicitly through the claims, that the

invention has one set of metes and bounds, when the applicant has already clearly stated

elsewhere that the invention necessarily has a different set of metes and bounds.

APPLICABILITY OF OMITTED ESSENTIAL ELEMENT LAW

It is respectfully submitted that the present rejection of Claims 1-8, 10-17, 19, and 20

constitutes an erroneous application of the "omitted essential element" law. Specifically, the

present applicant has not made any statements whatsoever to indicate that the invention recited in

Claims 1-8, 10-17, 19, and 20 is not what the applicant considers to be the invention. Nor has

the applicant stated that the elements recited in Claims 1-8, 10-17, 19, and 20 would be

impossible to implement in the absence of elements that are not recited in Claims 1-8, 10-17, 19,

and 20. Rather, it is entirely possible to implement the elements recited in Claims 1-8, 10-17, 19,

and 20 without also determining a required recovery time.

Further, the Office Action fails to identify any statement in the Specification, or made by

the Applicant elsewhere, that even remotely implies that the invention recited in Claims 1-8, 10-

17, 19, and 20 could not be practiced in the absence of unclaimed elements, namely "determining

a required recovery time, wherein the required recovery time indicates a maximum length of time

that is to be allowed for recovering after said database system failure." Therefore, any attempt to

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[2] "In this case, the original disclosure clearly identifies the console as the only possible location for the controls."
GENTRY at 1503.

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force such unclaimed elements into Claims 1-8, 10-17, 19, and 20 would unduly narrow the

claim.

For the reasons given above, it is respectfully submitted that Claims 1-8, 10-17, 19, and

20 are not missing any elements that are essential to practicing the invention that is recited in

Claims 1-8, 10-17, 19, and 20. Further, the metes and bounds of the invention set forth in Claims

1-8, 10-17, 19, and 20 do not contradict any statements about the invention elsewhere. Rather,

Applicant goes to great effort to refrain from making any statements about the invention (as

opposed to embodiments thereof) outside the claims themselves, since at best such statements are

innocuously redundant with the claims, and at worst they are confusingly contradictory with the

claims. Removal of the rejection to Claims 1-8, 10-17, 19 and 20 are therefore requested.

CLAIM REJECTIONS--35 U.S.C. § 101

Claims 1-9 and 19 were rejected under 35 U.S.C. § 101 because the claimed invention is

allegedly directed to non-statutory subject matter. More specifically, the Office Action alleges

that the claimed subject matter lacks a practical application of a judicial exception (law of nature,

abstract idea, naturally occurring article/phenomenon) since it fails to produce a useful and

tangible result. This rejection is respectfully traversed.

Claims 1-9 and 19 clearly fall into a statutory category because the claim limitations

"storing a checkpoint value" and "writing changes from volatile to non-volatile memory" (from

independent Claims 1 and 9) indicate a useful and tangible result, namely, the act of "storing"

and the act of "writing." To categorize each of these limitations as an abstract idea, law of

nature, or naturally occurring phenomenon is ludicrous on its face. Applicants are unaware of

any human capable of, for example, "writing changes from volatile to non-volatile memory to

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advance a checkpoint value" in their head. As such, the rejection alleged by the Office Action is

not understood by the Applicants.

The Office Action identifies the purpose of the invention as a "mechanism for controlling

the amount of recovery downtime after a database system failure." (*Office Action*, p. 3)

Controlling the amount of recovery downtime is achieved by, among other things, the two claim

limitations identified above. These claim limitations are clearly actions and not an idea. As the

claimed invention falls into a statutory category, withdrawal of the rejection under 35 U.S.C. §

101 is respectfully requested.

CLAIM REJECTIONS—35 U.S.C. § 103

Claims 1-3, 6-12 and 15-20 were rejected under 35 U.S.C. § 103(a) as being allegedly

unpatentable over "background, specification page 1, paragraph [0004] to page 9, paragraph

[0028]" ("*APA*") in view of U.S. Patent No. 5,485,608 ("*Lomet*"), and further in view of U.S.

Patent No. 6,185,699 ("*Haderle*") This rejection is respectfully traversed.

Claims 4 and 13 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable

over *APA* in view of *Lomet*, and further in view of *Haderle* as applied to claims 1-3, 6-12 and 15-

20 above, and further in view of "ARIES-RRH: restricted repeating of history in the ARIES

transaction recovery method" issued to Mohan et al., ("*Mohan*"). This rejection is respectfully

traversed.

**THE CITED ART DOES NOT TEACH OR DISCLOSE EACH
LIMITATION OF THE PENDING CLAIMS**

Even if the cited art were to be properly combined, each of the pending claims recites at

least one element that is not disclosed, taught, or suggested by the cited art, either individually or

in combination.

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<u>Claim 1</u>

Claim 1, as amended, recites:

> "storing a checkpoint value that indicates which records of a plurality of records
>   have to be processed after the failure, wherein the plurality of records
>   indicate changes for a plurality of data blocks; and
> **writing changes from volatile memory to nonvolatile memory to advance the**
>   **checkpoint value based on a user-specified value that corresponds to**
>   **the amount work that is required during a redo phase of recovery.**"
>   (emphasis added)

At least the above-bolded element of Claim 1 is not disclosed, taught, or suggested by

APA, Lomet, or *Haderle*, either individually, or in any combination.

Claim 1 recites "writing changes from volatile memory to nonvolatile memory to advance

the checkpoint value <u>based on a user-specified value that corresponds to how much work will be</u>

<u>required during a redo phase of recovery.</u>" The Office Action admits that the "combination [of

APA and *Lomet*] fails to disclose in detail" this limitation. The Office Action alleges that "a

user-specified value that corresponds to the amount of work that is required during a redo phase

of recovery" is disclosed in Haderle in Col. 2 lines 29-43 and Col. 6, lines 19-55.

The two cited sections read as follows:

> In one embodiment, the invention may be implemented to provide
> a method of DBMS restart recovery that allows transactions to access data
> that does not have restart recovery work pending. Access to data having
> pending restart recovery work is restricted, and a transaction is denied
> access to this data. In another embodiment, the inventive method allows
> certain transactions to access restricted data that has restart recovery work
> pending. These transactions are transactions that do not require data
> consistency. Regardless of the embodiment, the invention allows full
> recovery to be completed concurrent to data transaction processing that
> requires access to the database data. An amount of restart recovery
> processing may be postponed until after the DBMS has begun accepting
> new work requests. (***Haderle***, Col. 2, lines 29-43)

> In addition to the various hardware embodiments described above,
> a different aspect of the invention concerns a method for recovering shared

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databases using the present invention.

In one embodiment, the method blocks transactions from accessing data
that has restart recovery work pending. A transaction is a program unit
whose execution preserves the consistency of a database. For example, if
before a transaction executes a database is in a consistent state then, once
it completes its execution, the database should remain in a consistent state.
A transaction is a program unit that assesses and possibly updates various
data items contained in a database.

Transactions

As reflected in FIG. 2, a transaction block diagram is shown. A transaction
starts in the initial (in-flight) state 202. When it reaches its last statement it
enters a partially committed state 204. At this point, the transaction has
completed its execution, but it is still possible that it may have to be
aborted. In the preferred embodiment of the present invention, writes to
storage take place only after a transaction has entered the commit stage as
shown in task 208. As discussed above, one way to implement such a
scheme is to store any value associated with such writes to storage
temporarily in a nonvolatile storage, and to perform the actual writes only
at commit time 208. A committed transaction will then be able to
complete its write except in the case of hardware storage failures.

The transaction enters the failed state 206 after it is determined that the
transaction cannot proceed with normal execution, for example, due to
hardware or logical errors or due to user request. In this case, the
transaction must be rolled back. Once a rollback has occurred, the
transaction enters the aborted state 210. (*Haderle*, Col. 6, lines 19-55)

There is no teaching or suggestion anywhere in *Haderle* of writing changes from volatile

memory to nonvolatile memory based on a user-specified value that corresponds to the amount

work that is required during a redo phase of recovery. At best, *Haderle* discusses how a DBMS

may access transactions that do not have recovery work pending (Col. 2, lines 29-43). The

"amount of work required during a redo phase of recovery" as recited in Claim 1 is never

disclosed in this section of *Haderle*, much less the amount of work being "a user-specified

value." Furthermore, Applicants fail to see any relation at all between the transactions as stated

in *Haderle*, Col. 6, lines 19-55, and any of the limitations of Claim 1. As such, the Examiner is

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invited to point out, with particularity, how Col. 6, lines 19-55 of *Haderle* teaches any of the

limitations of Claim 1.

Consequently, the element of "writing changes from volatile memory to nonvolatile

memory to advance the checkpoint value based on a user-specified value that corresponds to the

amount work that is required during a redo phase of recovery" is not disclosed, taught, or

suggested by *Haderle*. As at least one element is not disclosed, taught, or suggested by *APA*,

Lomet, or *Haderle*, either individually or in combination, it is respectfully submitted that Claim 1

is patentable over the cited art and is in condition for allowance.

Claim 9

Claim 9, as amended, recites:

> "storing a checkpoint value that indicates which records of a plurality of records
>   have to be processed after the failure, wherein the plurality of records
>   indicate changes for a plurality of data blocks;
> determining a required recovery time, wherein the required recovery time
>   indicates a maximum length of time that is to be allowed for recovering
>   after said database system failure; and
> **writing changes from volatile memory to nonvolatile memory to advance the
>   checkpoint value based on a maximum number of data block reads
>   that is able to be performed in the required recovery time.**" (emphasis
>   added)

At least the above-bolded element of Claim 9 is not disclosed, taught, or suggested by

APA or Lomet, either individually, or in combination.

The Office Action admits that that Applicants' arguments from the response mailed July

7, 2007, were considered and persuasive with respect to the rejection of claims 1-20 under 35

USC 103. (Office Action, p. 9). However, the rejection offered with respect to Claim 9 is

identical to the rejection offered in the last Office Action. Applicants' suspect that *Haderle* was

to be applied to the limitation "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on a maximum number of data block reads that is able to be performed in the required recovery time." If this was the circumstance, the arguments as stated with Claim 1 are equally applicable with respect to the recited limitations for Claim 9. In addition, arguments with respect to *Lomet* follows.

Lomet fails to disclose the limitation in Claim 9 of "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value <u>based on a maximum number of data block reads that are able to be performed in the required recovery time</u>." The Office Action admits that the "APA fails to explicitly disclose" this limitation.

There is no teaching or suggestion anywhere in *Lomet* of writing changes from volatile memory to nonvolatile memory based on a maximum number of data block reads that can be performed in the required recovery time. Rather, the sections identified by the Office Action disclose the use of checkpoints in a redo log (Col. 13, lines 59-61) and the advantages of using N-log undo at recovery time (Col. 14, lines 62-67).

Lomet states "Checkpoints provide a major advantage of a pure RLOG which is that the system has explicit control over the size of the redo log and hence the time required for redo recovery." (Col. 13, lines 59-61). Though *Lomet* teaches the use of checkpoints and the size of the redo log, "advancing a checkpoint based upon a maximum number of data block reads that can be performed in the required recovery time" is not taught or disclosed. In fact, there is no mention of basing the checkpoint based on a maximum number of data block reads, let alone writing changes from volatile memory to non-volatile memory to advance such a checkpoint value.

The cited section in *Lomet* on the impact of system performance of N-log undo at recovery time (Col. 14, lines 62-67) does not discuss or suggest any *checkpoint value based on a maximum number of data block reads that can be performed in the required recovery time.* Consequently, the element of "writing changes from volatile memory to nonvolatile memory to advance the checkpoint value based on a maximum number of data block reads that can be performed in the required recovery time" is not disclosed, taught, or suggested by *Lomet*.

As at least one element is not disclosed, taught, or suggested by the *APA* or *Lomet*, either individually or in combination, it is respectfully submitted that Claim 9 is patentable over the cited art and is in condition for allowance.

Claims 2-8 and 10-18

Claims 10 and 18 feature limitations similar to those discussed above with respect to Claims 1 and 9 respectively, except that Claims 10 and 18 are recited in computer-readable medium format. Consequently, for at least the reasons given above with respect to Claims 1 and 9, it is respectfully submitted that Claims 10 and 18 are patentable over the cited art and are each in condition for allowance.

Claims 2-8, 10-17, and 19-20 are dependent claims, each of which depends (directly or indirectly) on one of the claims discussed above. Each of Claims 2-8, 10-17, and 19-20 is therefore allowable for the reasons given above for the claim on which it depends. In addition, each of Claims 2-8, 10-17, and 19-20 introduces one or more additional limitations that independently render it patentable. However, due to the fundamental differences already identified, to expedite the positive resolution of this case a separate discussion of those

limitations is not included at this time, although the Applicants reserve the right to further point

out the differences between the cited art and the novel features recited in the dependent claims.

CONCLUSION

     For the reasons set forth above, it is respectfully submitted that all of the pending claims

are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is

believed next in order, and that action is most earnestly solicited.

     The Examiner is respectfully requested to contact the undersigned by telephone if it is

believed that such contact would further the examination of the present application.

     Please charge any shortages or credit any overages to Deposit Account No. 50-1302.

               Respectfully submitted,

               Hickman Palermo Truong & Becker LLP

Dated: _____12/6/07_____   /RobertSChee#58554/_____
               Robert S. Chee
               Reg. No. 58,554

2055 Gateway Place, Suite 550
San Jose, California   95110-1083
Telephone No.: (408) 414-1080
Facsimile No.: (408) 414-1076

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